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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,103	03/12/2001	Akira Tamatani	204194US0	6450

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EXAMINER	
DI GRAZIO, JEANNE A	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 04/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Al

Office Action Summary	Application No.	Applicant(s)	
	09/803,103	TAMATANI ET AL.	
	Examiner	**Art Unit**	
	Jeanne A. Di Grazio	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 November 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-4,8-13 and 18-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4,8-13 and 18-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The Claims

Claims 1-4, 8-13 and 18-24 are currently pending before the Office and are the subject of this final rejection. Claims 5-7 and 14-17 have previously been cancelled.

Priority

Priority to Japanese Patent Application No. 2000-102738 (April 4, 2000) is claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US 5,978,061) in view of United States patent 6,181,406 B1 (to Morimoto et al.).

Per claim 1: A sealing material provided on a periphery of a substrate for preventing leakage of liquid crystal, projections formed by etching a film formed on the substrate, and another substrate opposing the substrate being remote therefrom by a gap and being supported by the projections, wherein an area occupying ratio of the projections with respect to a region enclosed by the sealing material is not less than 0.001 and not more than 0.003.

Per claim 2: The area occupying ratio is not less than 0.001 and not more than 0.002.

Per claim 3: The area occupying ratio is not less than 0.001 and not more than 0.0015.

Per claim 4: The film is formed of an acrylic resin.

Per claims 1-4: Miyazaki has a sealing material provided on a periphery of a substrate for preventing leakage of liquid crystal (Figure 30, seal forming an injection port, 58). Miyazaki has spacers disposed in specified arrangements for maintaining substrate gap (Figure 19). Miyazaki teaches that spacers may be formed of acrylic resin (Col. 8, Line 5).

Miyazaki does not appear to explicitly specify that the area occupying ratio is not less than 0.001 and not more than 0.003.

Miyazaki teaches that the distribution density of spacers (projections) should exceed 0.00002 square millimeters but be less than 0.005 square millimeters (Col. 19, Lines 49-50) for the following reasons.

If the spacer distribution density is under 0.00002 square millimeter, the mechanical strength of the spacer is insufficient and it is difficult to uniformly precisely control the distance between the two substrates (Col. 19, Lines 50-54).

If the spacer distribution density exceeds 0.005 square millimeter, low temperature bubbling occurs and display quality declines (Col. 19, Lines 54-62).

The Morimoto reference teaches and discloses an active matrix liquid crystal display device and specifies, "The sizes, positions and number of spacers (and the spacers are columnar as can be seen in Figures 5 and 8 where the spacer is number 66) are determined in accordance with the rigidity of the liquid crystal panel. The density at which the spacers are disposed is substantially proportional to the rigidity of the liquid crystal panel. When the rigidity is too large, the liquid crystal composition greatly shrinks as compared with shrinkage of the liquid crystal panel at a low temperature, and vacuum bubbles generate in a screen. On the other hand, when the rigidity is small, if an external force is applied to the liquid crystal display device, those of the spacers on which the force acts break, and the gap between the array and opposite substrates lacks in uniformity." Column 7, Lines 1-15).

That having been noted, Morimoto teaches ranges of spacer density distribution (Column 7, Lines 1-34) that prevent bubbles and that contribute to uniform substrate gap.

It is furthermore noted that area occupying ratio or spacer distribution density is a function of several variables. The several variables include: (1) the type of display, (2) the type or phase of liquid crystal material, (3) temperature, (4) force applied to the display panel, (5) rigidity of the panel and (6) substrate thickness.

Applicant's Specification has presented no specific guidance on any of the above factors but instead provides broad, generalized examples of when blurs and bubbles can be seen. As such, this is not an unexpected result. Applicant's result of reducing blurs and bubbles is exactly the result sought.

It is furthermore noted, that it is not just the area occupying ratio of the spacers that affects blur and bubbles. Rather, Applicant's Specification states, "Even if blurs in orientation (deficiencies in orientation process of the orientation film) owing to the columnar spacers shall be generated, problems of blurs in display such as leakage of light might be eliminated since the columnar spacers and peripheries thereof are covered by the black matrix layer." (Specification at page 10, lines 14-18).

Therefore, it appears to the Examiner, that the elimination of blurs and bubbles may also be the result of the presence of the black matrix.

Therefore, in light of the teachings in Miyazaki and Morimoto, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to precisely set the range for area occupying ratio of spacers in a liquid crystal device to maximize spacer mechanical strength, uniformly, precisely control the distance between two substrates, and to prevent low temperature bubbling. With Miyazaki's ranges of area occupying ratio, display quality is maximized; therefore, one of ordinary skill in the art of liquid crystals would have been motivated to select Applicant's ranges for area occupying ratios based on the desire for optimal display performance and for the other reasons as stated.

Claim 8, 10-11, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki Ryuji (JP-10-104642) in view of Kajita et al. (US 6,275,280 B1).

Per claims 8, 10-11, and 19-20: Miyazaki has the steps of applying a sealing material on a periphery of a substrate in annular form except for an injection inlet for liquid crystal, overlapping another substrate onto the substrate with projections and sealing material interposed

therebetween, and injecting liquid crystal through the liquid crystal injection inlet into a region enclosed by the sealing material (Figures 1-6).

Miyazaki states that liquid crystal is injected into an injection port and a pair of substrates are held under a given pressure for a specified time after which the sealing resin is cured (Abstracts) suggesting that the seal is cured after a specified time from injection of the liquid crystal. Miyazaki also states that a holding time for the pressure can be lengthened (beyond 30 minutes) so that superfluous liquid crystal can be made to completely discharge [0032].

Miyazaki applies a pressurizing force to the substrates (Abstracts); however, Miyazaki does not appear to explicitly specify applying a pressure of not less than 20,000Pa and not more than 40,000 Pa.

Kajita teaches resin spacers formed by etching (Col. 16, Lines 64-67) and a compression force of about 10,000 to 100,000 Pa that is normally applied to substrates (Col. 3, Lines 59-61).

Kajita teaches that this range of force is normal when adjoining substrates for a liquid crystal device and to prevent bubbles (Column 4, Lines 1-12).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Kajita for an optimal force applied to substrates as a normal range of compressive force applied to LCD substrates in order to prevent bubbles.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki Ryuji (JP-10-104642) in view of Kajita et al. (US 6,275,280 B1) and further in view of Ogura Makoto (JP-59-078320).

Per claim 9: Miyazaki does not appear to explicitly specify simultaneous sealing of an injection inlet and pressure applied to both substrates.

Ogura does have a step of fixing sealing material to an injection opening while pressing electrode plates (Abstract) to reduce the number of separate steps required in the manufacturing process and thereby improve production and yield.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Ogura to reduce the number of separate process steps required in the manufacturing of an LCD device and to therefore improve production and yield.

Claims 12, 13, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki Ryuji (JP-10-104642) in view of Miyazaki et al. (US 5,978,061) in view of Morimoto et al. (US 6,181,406 B1) and further in view of Kajita et al. (US 6,275,280 B1).

Per claims 12, 13, 21, and 22: Miyazaki has the steps of applying a sealing material on a periphery of a substrate in annular form except for an injection inlet for liquid crystal, overlapping another substrate onto the substrate with projections and sealing material interposed therebetween, and injecting liquid crystal through the liquid crystal injection inlet into a region enclosed by the sealing material (Figures 1-6).

Miyazaki states that liquid crystal is injected into an injection port and substrates are pressed under an applied pressure for a specified time after which the sealing resin is cured (Abstracts) suggesting that the seal is cured after a specified time from injection of the liquid

crystal. Miyazaki also states that a holding time for the pressure can be lengthened (beyond 30 minutes) so that superfluous liquid crystal can be made to completely discharge [0032].

Miyazaki does not appear to explicitly specify that the area occupying ratio of spacers with respect to a region enclosed by the sealing material being designed to be not less than 0.001 and not more than 0.003.

Miyazaki, however, teaches that the distribution density of spacers (projections) should exceed 0.00002 square millimeters but be less than 0.005 square millimeters (Col. 19, Lines 49-50) for the following reasons. It may be implied that the spacers of Miyazaki are formed by etching a (acrylic resin) film on a substrate.

If the spacer distribution density is under 0.00002 square millimeter, the mechanical strength of the spacer is insufficient and it is difficult to uniformly precisely control the distance between the two substrates (Col. 19, Lines 50-54).

If the spacer distribution density exceeds 0.005 square millimeter, low temperature bubbling occurs and display quality declines (Col. 19, Lines 54-62).

The Morimoto reference teaches and discloses an active matrix liquid crystal display device and specifies, "The sizes, positions and number of spacers (and the spacers are columnar as can be seen in Figures 5 and 8 where the spacer is number 66) are determined in accordance with the rigidity of the liquid crystal panel. The density at which the spacers are disposed is substantially proportional to the rigidity of the liquid crystal panel. When the rigidity is too large, the liquid crystal composition greatly shrinks as compared with shrinkage of the liquid crystal panel at a low temperature, and vacuum bubbles generate in a screen. On the other hand, when the rigidity is small, if an external force is applied to the liquid crystal display device, those of

the spacers on which the force acts break, and the gap between the array and opposite substrates lacks in uniformity." Column 7, Lines 1-15).

That having been noted, Morimoto teaches ranges of spacer density distribution (Column 7, Lines 1-34) that prevent bubbles and that contribute to uniform substrate gap.

It is furthermore noted that area occupying ratio or spacer distribution density is a function of several variables. The several variables include: (1) the type of display, (2) the type or phase of liquid crystal material, (3) temperature, (4) force applied to the display panel, (5) rigidity of the panel and (6) substrate thickness.

Applicant's Specification has presented no specific guidance on any of the above factors but instead provides broad, generalized examples of when blurs and bubbles can be seen. As such, this is not an unexpected result. Applicant's result of reducing blurs and bubbles is exactly the result sought.

It is furthermore noted, that it is not just the area occupying ratio of the spacers that affects blur and bubbles. Rather, Applicant's Specification states, "Even if blurs in orientation (deficiencies in orientation process of the orientation film) owing to the columnar spacers shall be generated, problems of blurs in display such as leakage of light might be eliminated since the columnar spacers and peripheries thereof are covered by the black matrix layer." (Specification at page 10, lines 14-18).

Therefore, it appears to the Examiner, that the elimination of blurs and bubbles may also be the result of the presence of the black matrix.

Therefore, in light of the teachings in Miyazaki and Morimoto, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to

modify Miyazaki in view of Morimoto to precisely set the range for area occupying ratio of spacers in a liquid crystal device to maximize spacer mechanical strength, uniformly, precisely control the distance between two substrates, and to prevent low temperature bubbling. With Miyazaki's ranges of area occupying ratio, display quality is maximized; therefore, one of ordinary skill in the art would have been motivated to select Applicant's ranges for area occupying ratios based on the desire for optimal display performance and for the other reasons as stated.

Miyazaki does not appear to explicitly specify the magnitude of pressure applied to the substrates.

Kajita teaches resin spacers formed by etching (Col. 16, Lines 64-67) and a compression force of about 10,000 to 100,000 Pa that is normally applied to substrates (Col. 3, Lines 59-61).

Kajita teaches that this range of force is normal when adjoining substrates for a liquid crystal device to prevent bubbles (Column 4, Lines 1-12).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Kajita for an optimal force applied to substrates as a normal range of compressive force applied to LCD substrates to prevent bubbles.

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki Ryuji (JP-10-104642) in view of Fukuda (US 6,525,799 B1) in view of Miyazaki et al. (US 5,978,061) in view of Morimoto et al. (US 6,181,406 B1) and further in view of Kajita et al. (US 6,275,280 B1).

Per claims 23 and 24: Miyazaki has the steps of applying a sealing material on a periphery of a substrate in annular form except for an injection inlet for liquid crystal, overlapping another substrate onto the substrate with projections and sealing material interposed therebetween, and injecting liquid crystal through the liquid crystal injection inlet into a region enclosed by the sealing material (Figures 1-6).

Miyazaki states that liquid crystal is injected into an injection port and the substrates are pressed and thus held for a specified time after which the sealing resin is cured (Abstract) suggesting that the seal is cured after a specified time from injection of the liquid crystal. Miyazaki also states that a holding time for the pressure can be lengthened (beyond 30 minutes) so that superfluous liquid crystal can be made to completely discharge [0032].

Miyazaki does not appear to explicitly specify that the heights of projections being varied by not less than 0.05 and not more than 0.2 micrometers.

Fukuda teaches that the peak height of spacers are in the range of 0.05 to 0.50 μm in order to prevent conduction failure between conductive particles and a metal thin film and so that improved reliability of the display can be realized (Col. 19, Lines 19-24).

Therefore it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Fukuda in order to prevent conduction failure between conductive particles and a metal thin film and so that improved reliability of the display can be realized (Col. 19, Lines 19-24).

Miyazaki does not appear to explicitly specify that the area occupying ratio of spacers with respect to a region enclosed by the sealing material being designed to be not less than 0.0014 and not more than 0.0029; however, Miyazaki teaches that the distribution density of

spacers (projections) should exceed 0.00002 square millimeters but be less than 0.005 square millimeters (Col. 19, Lines 49-50) for the following reasons. It may be implied that the spacers of Miyazaki are formed by etching a film on a substrate.

If the spacer distribution density is under 0.00002 square millimeter, the mechanical strength of the spacer is insufficient and it is difficult to uniformly precisely control the distance between the two substrates (Col. 19, Lines 50-54).

If the spacer distribution density exceeds 0.005 square millimeter, low temperature bubbling occurs and display quality declines (Col. 19, Lines 54-62).

The Morimoto reference teaches and discloses an active matrix liquid crystal display device and specifies, "The sizes, positions and number of spacers (and the spacers are columnar as can be seen in Figures 5 and 8 where the spacer is number 66) are determined in accordance with the rigidity of the liquid crystal panel. The density at which the spacers are disposed is substantially proportional to the rigidity of the liquid crystal panel. When the rigidity is too large, the liquid crystal composition greatly shrinks as compared with shrinkage of the liquid crystal panel at a low temperature, and vacuum bubbles generate in a screen. On the other hand, when the rigidity is small, if an external force is applied to the liquid crystal display device, those of the spacers on which the force acts break, and the gap between the array and opposite substrates lacks in uniformity." Column 7, Lines 1-15).

That having been noted, Morimoto teaches ranges of spacer density distribution (Column 7, Lines 1-34) that prevent bubbles and that contribute to uniform substrate gap.

It is furthermore noted that area occupying ratio or spacer distribution density is a function of several variables. The several variables include: (1) the type of display, (2) the type

or phase of liquid crystal material, (3) temperature, (4) force applied to the display panel, (5) rigidity of the panel and (6) substrate thickness.

Applicant's Specification has presented no specific guidance on any of the above factors but instead provides broad, generalized examples of when blurs and bubbles can be seen. As such, this is not an unexpected result. Applicant's result of reducing blurs and bubbles is exactly the result sought.

It is furthermore noted, that it is not just the area occupying ratio of the spacers that affects blur and bubbles. Rather, Applicant's Specification states, "Even if blurs in orientation (deficiencies in orientation process of the orientation film) owing to the columnar spacers shall be generated, problems of blurs in display such as leakage of light might be eliminated since the columnar spacers and peripheries thereof are covered by the black matrix layer." (Specification at page 10, lines 14-18).

Therefore, it appears to the Examiner, that the elimination of blurs and bubbles may also be the result of the presence of the black matrix.

Therefore, in light of the teachings in Miyazaki, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Morimoto to precisely set the range for area occupying ratio of spacers in a liquid crystal device to maximize spacer mechanical strength, uniformly, precisely control the distance between two substrates, and to prevent low temperature bubbling. With Miyazaki's ranges of area occupying ratio, display quality is maximized; therefore, one of ordinary skill in the art would have been motivated to select Applicant's ranges for area occupying ratios based on the desire for optimal display performance and for the other reasons as stated.

Miyazaki does not appear to explicitly specify the magnitude of pressure applied to the substrates.

Kajita teaches resin spacers formed by etching (Col. 16, Lines 64-67) and a compression force of about 10,000 to 100,000 Pa that is normally applied to substrates (Col. 3, Lines 59-61) and to prevent bubbling.

Kajita teaches that this range of force is normal when adjoining substrates for a liquid crystal device.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Kajita for an optimal force as a normal range of compressive force applied to LCD substrates that prevents bubbles.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki Ryuji (JP-10-104642) in view of Kajita et al. (US 6,275,280 B1) and further in view of Ogura Makoto (JP-59-078320).

Per claim 18: Miyazaki has the steps of applying a sealing material on a periphery of a substrate in annular form except for an injection inlet for liquid crystal, overlapping another substrate onto the substrate with projections and sealing material interposed therebetween, and injecting liquid crystal through the liquid crystal injection inlet into a region enclosed by the sealing material (Figures 1-6).

Miyazaki does not appear to explicitly specify the magnitude of pressure applied to the substrates.

Kajita teaches resin spacers formed by etching (Col. 16, Lines 64-67) and a compression force of about 10,000 to 100,000 Pa that is normally applied to substrates (Col. 3, Lines 59-61).

Kajita teaches that this range of force is normal when adjoining substrates for a liquid crystal device and to prevent bubbling.

Kajita is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to optimize a range of applied pressure to substrates to prevent bubbles (Column 4, Lines 1-12).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Kajita for an optimal force applied to substrates as a normal range of compressive force applied to LCD substrates and to prevent bubbles.

Miyazaki does not appear to explicitly have simultaneous sealing of an injection inlet and pressure applied to both substrates.

Ogura does have a step of fixing sealing material to an injection opening while pressing electrode plates (Abstract).

Ogura is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to simultaneously fix sealing material to an injection opening while pressing substrates to reduce the number of separate steps required in the manufacturing process and thereby improve production and yield.

Therefore it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Miyazaki in view of Ogura to reduce the number of

separate process steps required in the manufacturing of an LCD device and to therefore improve production and yield.

Response to Arguments

In view of the Appeal Brief filed on November 22, 2004, PROSECUTION IS HEREBY REOPENED.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio
Patent Examiner
Art Unit 2871

JDG

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